Charles Eduardo Snyder

5921 Edgehill Court ◊ Alexandria, Virginia 22303 ◊ 814.746.0531 ◊ snyder.charles.e@gmail.com

Dear VT-ARC Staffing Office:

Exploring Virginia Tech's website, I discovered VT's co-located research and development organizations—which included a link to the Virginia Tech Applied Research Corporation. VT-ARC's focus on innovation and collaboration, makes it an organization that I want to be a part of. Writing to apply for the Senior Research Analyst (Threat Emulation) position, I am very interested to learn about VT-ARC's approach to fundamental and applied research.

Specific to the responsibilities in the job description: I have worked as a Research Staff Member at the Institute for Defense Analyses for the last eight years. In my day-to-day work, I use a suite of tools to quantitatively assess chemical and biological threats—from transport and dispersion simulation to infectious disease modeling. I have also used such modeling and simulation tools to assess risk of advanced threat agents—feeding qualitative assessments of such agents. I continuously learn about and test emerging tools or concepts to be well postured to answer research questions.

My current work requires the production of unbiased analytic products, typically produced through the coordination of a multi-disciplinary team. And simply performing analysis is of little value if not well-communicated to the sponsor. In both team coordination and sponsor interaction, I push for the critical and appropriate use of models. In my case, this means using models not to fain some predictive outcome, but to help bring scope to a complex problem, give direction to sponsor decisions, and discover knowledge gaps. Often, the most valuable output to a sponsor is not the specific data output from the analysis, but rather the speculative insights and questions spawned during the analysis process.

Of course my work with DoD and DHS has required sponsor engagement to communicate interim and final results. Sharing knowledge is a highlight of my work—not just to sponsors but also internally. One aspect of my current job that I expect to extend to work at VT-ARC is strong collaboration between staff. I greatly value and take advantage of others' experience. I also enjoy mentoring new staff and research assistants.

Below, I have explicitly provided the administrative cover letter application requirements for processing convenience. I hope to discuss opportunities at VT-ARC soon.

Sincerely,

Charles Snyder

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For ease of access, the following provides the required cover letter content:

1. Title of position sought and the Position Requisition Number listed in the announcement

   RQN032 – Senior Research Analyst (Threat Emulation)

2. Contact information: Full name, address, phone number and email address

   Charles Snyder
   5921 Edgehill Court
   Alexandria VA, 22303
   Phone: 814.746.0531
   snyder.charles.e@gmail.com

3. Availability date

   April 2017, but flexible

4. Whether or not you are a citizen of the United States (optional for positions that do not require a security clearance – see Security Requirements above)

   U.S. citizen

5. Whether or not you hold a security clearance (and if so, what level/access and date of last investigation)

   Yes, I hold an active SECRET clearance, last investigated on 10/14/08

6. Current or last salary and desired salary

   Current salary: 130K (11% pension)
   Desired: negotiable

7. Education

   BS Chemical Engineering from Case Western Reserve University;
   PhD Chemical Engineering from the Pennsylvania State University

8. Please describe where/how you first heard of this position, e.g., Google search to our website, a friend, LinkedIn, professor's referral, trade association ad, etc.

   Exploring Virginia Tech's website led me to a link—co-located research and development organizations—which included a link to the Virginia Tech Applied Research Corporation. Intrigued by the VT-ARC website, I explored the career opportunities listed in the website.

9. Why you feel you would be a good fit for VT-ARC as well as this specific position

   (see cover letter body)

10. Any additional comments you deem appropriate (optional)

    (see cover letter body)

11. Your signature

    (see cover letter body)

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EXPERIENCE

Institute for Defense Analyses (IDA), Research Staff Member 2008—present
with active SECRET security clearance

Strategy, Forces and Resources Division ***(2012—present)***

Chemical, Biological, Radiological, and Nuclear (CBRN) Analysis Group

Support multiple Department of Defense and Department of Homeland Security agencies:

- Lead the development of analysis tools to enable CBRN hazard plume effects analysis with transport and dispersion models
- Model the spread of contagious disease (Susceptible, Exposed, Infectious, Removed methods)
- Model biological and chemical hazard spread through transit systems (analytic mass transfer approximation methods)
- Use a variety of analysis tools including Python, R, Mathematica, and Java Application Programming Interface hooks to enable data wrangling, software automation, and post-processing analysis

Operational Test and Evaluation Division ***(2008—2012)***

Supported the Director, Operational Test and Evaluation (DOT&E, Department of Defense):

- Represented the director and his deputies in all branches of the test and evaluation acquisition community
- Observed first hand and objectively evaluated operational system tests (primarily Unmanned Aerial Vehicles)—providing my assessment for the director's recommendation to Congress
- Provided technical guidance, support in test planning, and analytic analysis to the acquisition community and Director using a variety of quantitative techniques including Design of Experiments, Reliability Growth, and post-test analysis (e.g. Monte Carlo estimations of equipment availability)

Supported the Director, Office of SAFETY Act Implementation (Department of Homeland Security):

- Provided consolidated technical review and evaluation through a brief to the Director to enable informed decision to grant or deny limited liability status to anti-terrorism technology
- Developed policy and procedure to ensure consistent and unbiased analysis

The Pennsylvania State University (2003—2008)

Department of Chemical Engineering, PhD Candidate

PhD Thesis—Controlling Colloidal Interactions: Fabrication of Colloidal Assemblies Using Particle Lithography:

- Used of a variety of experimental techniques including nanoparticle synthesis, electron and optical microscopy, nanoparticle and colloidal particle characterization (e.g., surface charge, size distribution), particle isolation with density gradient centrifugation
- Drove experiment through modeling such as Brownian dynamic simulation, numerical analysis of asymmetrically functionalized colloidal interactions (van der Waals, electrostatic, and depletion induced forces), and Green's function use to characterize quorum sensing bacteria

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EDUCATION

The Pennsylvania State University, PhD in Chemical Engineering **May 2008**
Case Western Reserve University, BS in Chemical Engineering **May 2003**

Continuous post-graduate development includes:

IDA sponsored education

- Defense and research related: Aircraft Combat Survivability Short Course at the Naval Post Graduate School**,** DOT&E's Design of Experiments course**,** Georgia Tech's Basic Radar Concepts course**,** Defense Acquisition University Acquisition 101
- General leadership and personal development: Tufte's Data Visualization course, IDA task leadership course, DOT&E's Action Officer course, various writing workshops

Other personal development

- Online curriculum including, Stanford's Machine Learning course (by Andrew Ng), Coursera's "Learning How to Learn," various Java, Python, and other programming courses (through Northern Virginia Community College, Coursera, Udacity, etc.)

PUBLICATIONS

Lawrence, Alison E.; Smith, Forrest R.; Vig, John A. and Snyder, Charles E.; "User's Manual for the Chemical and Biological Attack Consequence Estimator Version 1.0" (2016).

Snyder, Charles E.; Grotte, Jeffrey H. and Willert, Jeffrey A.; "(U) Cassandra Homeland Analytic Product Support Technical Summary" (2016).

Smith, Forrest R.; Snyder, Charles E. and Lawrence, Alison E.; "User's Manual for the Hazard Prediction and Assessment Capability Batcher" (2015).

Snyder, Charles E.; Grotte, Jeffrey H.; Lloyd, Don A.; Smith, Monica A. and Yen, Terry A.; "(U) Encapsulation: A Quick-Look Assessment" (2015).

Snyder, Charles E.; Bombardt, John N.; Disraelly, Deena S. and Smith, Forrest R.; "(U) Transit Study Technical Review" (2014).

Yen, Terry A.; Last, Howard R.; Snyder, Charles E.; Demyanovich, James M. and Grotte, Jeffrey H.; "An Analytic Model for Chemical, Biological, Radiological, and Nuclear (CBRN) Requirements Generation for Percutaneous Protection (U)" (2013).

Niles, Michael F.; Demyanovich, James M.; Lloyd, Don A.; Miller, Drew, Platt, Nathan, Schultz, Douglas P.; Snyder, Charles E.; Urban, Jeffry T. and Grotte, Jeffrey H.; "Operational Effects Analytical Support Program (ASP) Long Term Effort—Chemical Biological Force Planning Construct—Phase II" (2013).

Freeman, Laura J.; Wells, Michael C.; Bell, Jonathan L. and Snyder, Charles E.; "Reliability Survey of DOT&E Acquisition Programs" (2013).

Thomas, Dean, Wells, Michael C.; Bell, Jonathan L. and Snyder, Charles E.; "Reliability Survey of DOT&E Acquisition Programs" (2012).

Shaw, Scott E.; Lambrecht, Kristen L; Snyder, Charles E.; "Tactical Unmanned Aircraft System Full-Rate Production Version V Configuration (RQ-7BV1) Limited User Test" (2011).

Snyder, Charles E. and Wells, Michael C.; "Reliability Survey of DOT&E Acquisition Programs" (2009).

Jerri, Huda A.; Sheehan, William P.; Snyder, Charles E.; and Velegol; Darrell, "Prolonging Density Gradient Stability" Langmuir, (April 2010).

Ramírez, Laura M.; Milner, Scott T.; Snyder, Charles E.; Colby, Ralph H.; and Velegol, Darrell; "Controlled Flats on Spherical Polymer Colloids" Langmuir (December, 2009).

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Velegol, Darrell; Shori, Shailesh; and Snyder, Charles E.; "Rayleigh–Bénard Instability in Sedimentation" Industrial & Engineering Chemistry Research, 48(5), 2414-2421 (2009).

Snyder, Charles E.; Ong, Melissa; and Velegol, Darrell; "In Solution Assembly of Colloidal Water" Soft Matter, 5, 1263-1268 (2009).

Parent, Mary E.; Snyder, Charles E.; Kopp, Nathaniel; and Velegol, Darrell, "Localized Quorum Sensing in Vibrio fischeri" Colloids and Surfaces B, 62, 180-187, (2008).

Yake, Allison M.; Snyder, Charles E.; and Velegol, Darrell; "Site-Specific Functionalization on Individual Colloids: Size Control, Stability and Multi-Layers" Langmuir, 23, 9069-9075 (2007).

Yake, Allison M.; Panella, Rocco A.; Snyder, Charles E.; and Velegol, Darrell. "Fabrication of Doublets by a Salting Out-Quenching-Fusing Technique." Langmuir, 22, 9135-9141 (2006).

Snyder, Charles E.; Yake, Allison M.; Feick, Jason D.; and Velegol, Darrell; "Nanoscale Functionalization and Site-Specific Assembly of Colloids by Particle Lithography." Langmuir, 21, 4813-4815 (2005).

Jones, Joseph F.; Holtzer, Gretchen L.; Snyder, Charles E.; Yake, Allison M.; and Velegol, Darrell; "Charge Nonuniformity Light Scattering." Colloids and Surfaces A, 267, 79-85 (2005).

PATENT

Velegol, Darrell; Feick, Jason D.; Yake, Allison M.; Snyder, Charles E.; "Particle lithography method and ordered structures prepared thereby." U.S Patent application PST-14302/36 (2005).

PRESENTATIONS

Snyder, Charles E.; Grotte, Jeffrey H.; Demyanovich, James M.; November 2016. Use of Modeling in Table-top Exercise Support. MORS Wargaming Symposium, Alexandria VA.

Snyder, Charles E.; Velegol, Darrell; June 2005. Nanoscale Functionalization and Site-Specific Assembly of Colloids by Particle Lithography. 79th ACS Colloid and Surface Science Symposium, Potsdam, NY.

Snyder, Charles E.; Velegol, Darrell; October 2006. Site Specific Functionalization of Colloids. The Pennsylvania State University Chemical Engineering Department Symposium. University Park, PA.

Snyder, Charles E.; Velegol, Darrell; June 2005. In-solution Directed Assembly of Heterogeneous Colloidal Aggregates. 233th American Chemical Society National Meeting, Chicago, IL.

TEACHING AND OTHER SELECT SERVICE

- **(2017)** Demonstrated and presented on the inner-workings of a home-build 3D printer at the Institute for Defense Analyses Science Fair for students of all ages
- **(2008-present)** Tutor college-bound students in math, physics, and chemistry through the Building Better Futures program—partnered with the Alexandria, Virginia public school system
- **(2014)** Designed and taught a 40-hour summer course for the Joint Science and Technology Institute—exposing college-bound students to basic programming (spreadsheet- and Python-based), statistics (to include bootstrapping), calculus, and transport and dispersion phenomena (see https://github.com/csnyd/Public2016/—JSTINotes.xlsx for curriculum notes and LinkToBootstrappingTutorial.txt for sample lecture)
- **(2007)** In addition to graduate teaching assistant responsibilities, through the Graduate Teaching Fellow Award at the Pennsylvania State University: co-taught "Biomedical Separation" under the Chemical Engineering department head